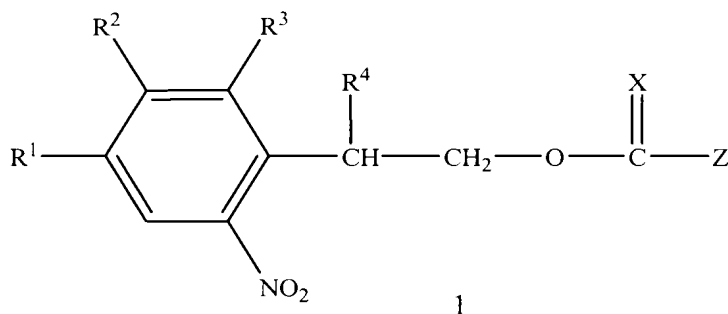


IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A compound having the formula (1):



wherein

R<sup>1</sup> is selected from the group consisting of H, NO<sub>2</sub>, CN, OCH<sub>3</sub>, a halogen, an alkyl having up to 4 carbon atoms, and an alkoxy having up to 4 carbon atoms;

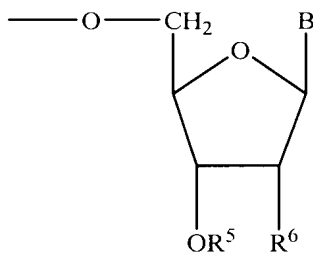
R<sup>2</sup> is selected from the group consisting of an aryl group, a substituted aryl group, a heteroaryl group, substituted heteroaryl group, an aroyl group, and a substituted aroyl group;

R<sup>3</sup> is selected from the group consisting of H, NO<sub>2</sub> and a halogen;

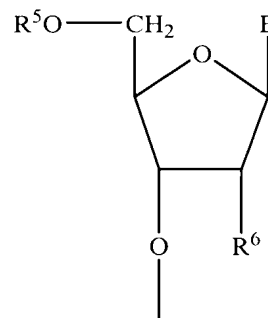
R<sup>4</sup> is selected from the group consisting of H, OCH<sub>3</sub> and an alkyl group having up to 4 carbon atoms;

X is selected from the group consisting of oxygen and sulfur; and

Z is selected from the group consisting of a leaving group, an alcoholate group, -OH, a N-atom of an amine compound, a deoxyribonucleoside and a ribonucleoside as represented by either of the following formulae (2) or (3):



2



3

wherein

$R^5$  is selected from the group consisting of a H, an oligonucleotide, a phosphitamidite group and a protecting group functional group useful in oligonucleotide synthesis;

$R^6$  is selected from the group consisting of H, OH, an alkoxyl having up to 4 carbon atoms, an alkenoxyl group having up to 4 carbon atoms, a substituted alkenoxyl group having up to 4 carbon atoms, or  $R^6$  is  $WR^8$  wherein W is selected from oxygen and sulfur and  $R^8$  is a protective group useful in oligonucleotide synthesis;

B is a base selected from the group consisting of adenine, cytosine, guanine, thymine, and uracil ~~and chemical modifications thereof~~, and when B is any one of adenosine, cytosine and guanine the amino functions on the heterocycle may bear a protective group useful in oligonucleotide synthesis; ~~or~~

~~Z is selected from the group consisting of a chemically modified deoxyribonucleoside, a chemically modified ribonucleoside, and an analog thereof.~~

Claim 2 (Canceled).

Claim 3 (Previously Presented): The compound of claim 1, wherein  $R^1$  is H and  $R^2$  is phenyl or substituted phenyl.

Claim 4 (Previously Presented): The compound of claim 1, wherein  $R^1$  is H and  $R^2$  is benzoyl or substituted benzoyl.

Claim 5 (Previously Presented): The compound of claim 1 wherein W is O and  $R^8$  is selected from the group consisting of an alkyl, alkenyl, acetal and silylether protective group.

Claim 6 (Previously Presented): The compound of claim 1, wherein W is S and  $R^8$  is an alkyl protective group.

Claim 7 (Previously Presented): The compound of claim 1, wherein  $R^6$  is selected from the group consisting of an O-methyl, O-ethyl, O-allyl, O-tetrahydropyranyl- O-methoxytetrahydropyranyl and an O-t-butyl dimethylsilyl.

Claim 8 (Previously Presented): The compound of claim 1, wherein B is selected from the group consisting of adenine, cytosine and guanine and wherein  $R^8$  is selected from the group consisting of phenoxyacetyl, 4-tert-butyl-phenoxyacetyl, 4-isopropyl-phenoxyacetyl and dimethylformamidino.

Claim 9 (Previously Presented): The compound of claim 1, wherein B is adenine and is selected from the group consisting of benzoyl and p-nitrophenyloxycarbonyl (p-NPEOC).

Claim 10 (Previously Presented): The compound of claim 1, wherein B is guanine and wherein  $R^8$  is selected from the group consisting of isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 11 (Previously Presented): The compound of claim 1, wherein B is cytosine and wherein R<sup>8</sup> is selected from the group consisting of benzoyl, isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 12 (Currently Amended): The compound of claim 1, wherein R<sup>5</sup> is a phosphitamide phosphitamidite group.

Claim 13 (Previously Presented): The compound of claim 1, wherein R<sup>5</sup> is an OH-protective group.

Claim 14 (Previously Presented): The compound of claim 13, wherein R<sup>5</sup> is a dimethoxytrityl- or a monomethoxytrityl- group.

Claim 15 (Original): The compound of claim 13, wherein R<sup>5</sup> is a silyl-group.

Claim 16 (Previously Presented): The compound of claim 1, wherein Z is a leaving group.

Claim 17 (Previously Presented): The compound of claim 16, wherein the leaving group is selected from the group consisting of chloride, imidazolyl and nitrophenoxyl.

Claims 18-23 (Canceled)

Claim 24 (Withdrawn-Currently Amended): A method for the light-controlled synthesis of oligonucleotides, wherein said method is comprised of the following steps:

- a) attaching, as a first building block, a nucleoside or nucleotide of claim 1 comprising the photolabile protective group at its primary hydroxyl group, to a support via its 3' secondary hydroxyl group;
- b) irradiating the support-bound nucleoside or nucleotide resulting from step a), such that the protective group at the primary hydroxyl group is removed, thereby deprotecting the primary hydroxyl group;
- c) reacting the support-bound nucleotide resulting from step b) in the presence of an activator with a second nucleotide selected from claim 12 comprising a protective group at its primary hydroxyl group and phosphoramidite functional group at its 3' secondary hydroxyl group, to form an internucleosidic phosphorous linkage;
- d) optionally capping unreacted primary hydroxyl groups with an inert alcohol protecting group;
- e) oxidizing the internucleosidic phosphorous linkage to the naturally occurring pentavalent state;
- f) iterating steps b) to d) while successively applying the phosphoramidite building blocks in a predetermined order until the desired oligonucleotide strand is completed; and
- g) removing of all nucleobase and phosphate protective groups.

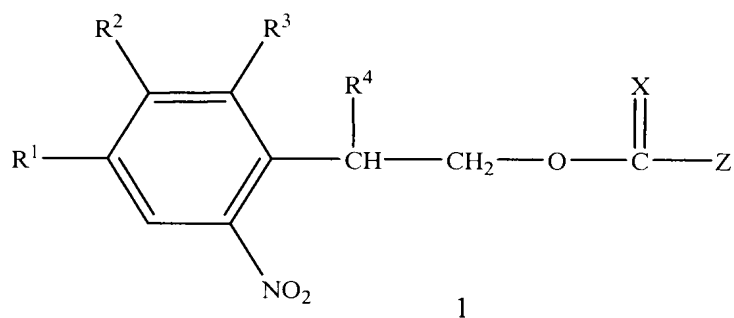
Claim 25 (Withdrawn-Currently Amended): A method for the light-controlled synthesis of oligonucleotides, wherein said method is comprised of the following steps:

- a) attaching, ~~[[a]]~~ as a first building block, a nucleoside or nucleotide of claim 1 comprising the photolabile protective group at its 3' secondary hydroxyl group, to a support via its primary hydroxyl group;

- b) irradiating the support-bound nucleotide resulting from step a), such that the protective group at the secondary hydroxyl group is removed, thereby deprotecting the 3' secondary hydroxyl group;
- c) reacting the support-bound nucleotide resulting from step b) in the presence of an activator with a second nucleotide selected from claim 12 comprising a protective group at its 3' secondary hydroxyl group and a phosphoramidite functional group at its primary hydroxyl group, to form an internucleosidic phosphorous linkage;
- d) optionally capping unreacted secondary hydroxyl groups with an inert alcohol protecting group;
- e) oxidizing the internucleosidic phosphorous linkage to the naturally occurring pentavalent state;
- f) iterating steps b) to d) while successively applying the phosphoramidite building blocks in a predetermined order until the desired oligonucleotide strand is completed; and
- g) removing of all nucleobase and phosphate protective groups.

Claims 26-29 (Canceled).

Claim 30 (Currently Amended): A compound having the formula (1):



wherein

$R^1$  is COOY, wherein Y is selected from the group consisting of an alkyl group of up to 10 carbon atoms,

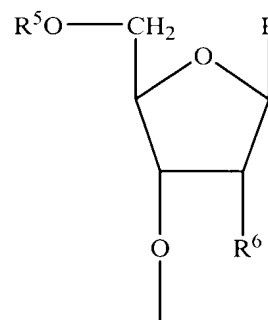
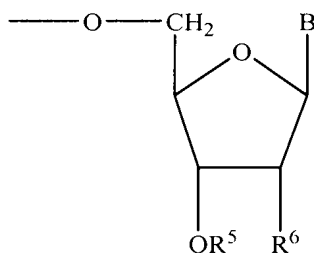
$R^2$  is selected from the group consisting of H, NO<sub>2</sub>, CN, OCH<sub>3</sub>, a halogen, an alkyl having up to 4 carbon atoms, an alkoxy having up to 4 carbon atoms;

$R^3$  is selected from the group consisting of H, NO<sub>2</sub> and halogen;

$R^4$  is selected from the group consisting of OCH<sub>3</sub>, an alkyl group having up to 4 carbon atoms and an optionally substituted alkyl group having up to 4 carbon atoms;

X is selected from the group consisting of oxygen or sulfur; and

Z is selected from the group consisting of a leaving group, an alcoholate, -OH, a N-atom of an amine compound, a deoxyribonucleoside and a ribonucleoside as represented by either of the following formulae (2) or (3):



wherein

$R^5$  is selected from the group consisting of a H, an oligonucleotide, a phosphoramidite group and a protecting group functional group useful in oligonucleotide synthesis;

$R^6$  is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, an alkenoxy having up to 4 carbon atoms, or a substituted alkenoxy having up to 4 carbon atoms, or  $R^6$  is  $WR^8$  wherein W is selected from oxygen and sulfur and  $R^8$  is selected from a protective group useful in oligonucleotide synthesis;

B is base selected from the group consisting of adenine, cytosine, guanine, thymine, and uracil, ~~and chemical modifications thereof~~ and in the case of adenosine, cytosine and

guanine the amino functions on the heterocycle may bear a protective group useful in oligonucleotide synthesis; ~~or~~

~~Z is selected from the group consisting of a chemically modified deoxyribonucleoside, a chemically modified ribonucleoside, and an analog thereof.~~

Claim 31 (Previously Presented): The compound of claim 30, wherein Y is an alkyl group selected from the group consisting of methyl and tertiary-butyl, and R<sup>2</sup> is H.

Claim 32 (Previously Presented): The compound of claim 30 wherein W is O and R<sup>8</sup> is selected from the group consisting of an alkyl, alkenyl, acetal and silylether protective group.

Claim 33 (Previously Presented): The compound of claim 30 wherein W is S and R<sup>8</sup> is selected from the group consisting of an alkyl protective group.

Claim 34 (Previously Presented): The compound of claim 30, wherein R<sup>6</sup> is selected from the group consisting of an O-methyl, O-ethyl, O-allyl, O-tetrahydropyranyl- O-methoxytetrahydropyranyl and an O-t-butyl dimethylsilyl.

Claim 35 (Previously Presented): The compound of claim 30, wherein B is selected from the group consisting of adenine, cytosine and guanine and said protective group is selected from the group consisting of phenoxyacetyl, 4-tert-butyl-phenoxyacetyl, 4-isopropyl-phenoxyacetyl and dimethylformamidino.



Claim 36 (Previously Presented): The compound of claim 30, wherein B is adenine and the protective group is selected from the group consisting of benzoyl and p-nitrophenyloxycarbonyl (p-NPEOC).

Claim 37 (Previously Presented): The compound of claim 30, wherein B is guanine and the protective group is selected from the group consisting of isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 38 (Previously Presented): The compound of claim 30, wherein B is cytosine and the protective group is selected from the group consisting of benzoyl, isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 39 (Currently Amended): The compound of claim 30, wherein R<sup>5</sup> is a ~~phosphitamide~~ phosphitamidite group.

Claim 40 (Previously Presented): The compound of claim 30, wherein R<sup>5</sup> is an OH-protective group.

Claim 41 (Previously Presented): The compound of claim 40, wherein R<sup>5</sup> is selected from a dimethoxytrityl- or a monomethoxytrityl- group.

Claim 42 (Previously Presented): The compound of claim 40, wherein R<sup>5</sup> is a silyl-group.

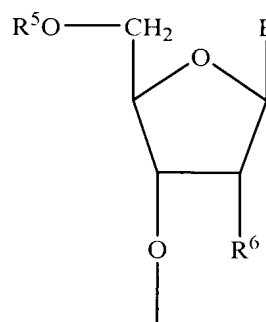
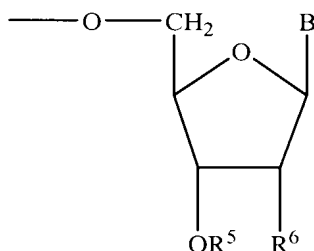
Claim 43 (Previously Presented): The compound of claim 30, wherein Z is a leaving group.

Claim 44 (Previously Presented): The compound of claim 43, wherein the leaving group is selected from the group consisting of chloride, imidazolyl and nitrophenoxyl.

Claim 45 (Previously Presented): The compound of claim 31, wherein Z is a leaving group.

Claim 46 (Previously Presented): The compound of claim 45, wherein the leaving group is selected from the group consisting of chloride, imidazolyl and nitrophenoxyl.

Claim 47 (Previously Presented): The compound of claim 1, wherein Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



wherein  $R^5$  is selected from the group consisting of a H and an oligonucleotide;

$R^6$  is selected from the group consisting of H, OH, an alkoxyl having up to 4 carbon atoms, an alkenoxyl group having up to 4 carbon atoms, a substituted alkenoxyl group having up to 4 carbon atoms, or  $R^6$  is  $WR^8$  wherein W is selected from oxygen and sulfur and  $R^8$  is a protective group;

B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 48 (Previously Presented): The compound of claim 1, wherein Z is selected from the group consisting of a deoxyribonucleoside and a ribonucleoside.

Claim 49 (Previously Presented): The compound of claim 1, wherein Z is selected from the group consisting of an alcoholate group, -OH and an amine.

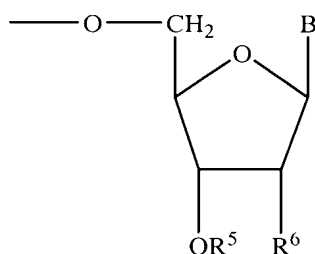
Claim 50 (Previously Presented): The compound of claim 1, wherein

$R^2$  is a phenyl group;

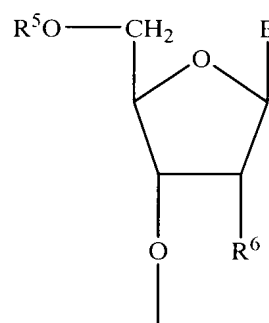
$R^4$  is a hydrogen atom or an alkyl group having up to 4 carbon atoms;

X is O;

and Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



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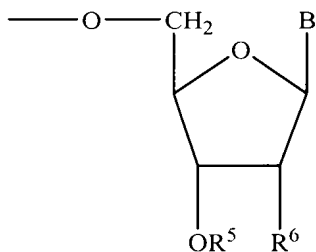
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wherein  $R^5$  is H;

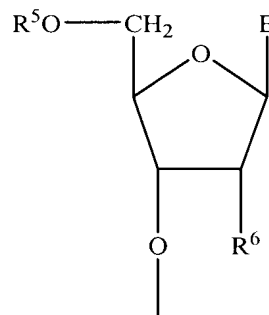
$R^6$  is selected from the group consisting of H, OH, an alkoxyl having up to 4 carbon atoms, and an alkenoxyl group having up to 4 carbon atoms;  
and

B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 51 (Previously Presented): The compound of claim 30, wherein Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



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wherein  $R^5$  is selected from the group consisting of a H and an oligonucleotide;

$R^6$  is selected from the group consisting of H, OH, an alkoxyl having up to 4 carbon atoms, an alkenoxyl group having up to 4 carbon atoms, a substituted alkenoxyl group having up to 4 carbon atoms, or  $R^6$  is  $WR^8$  wherein W is selected from oxygen and sulfur and  $R^8$  is a protective group;

B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 52 (Previously Presented): The compound of claim 30, wherein Z is selected from the group consisting of a deoxyribonucleoside and a ribonucleoside.

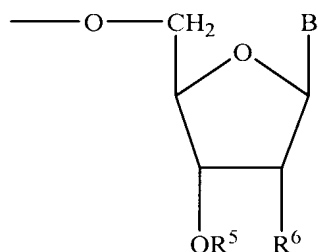
Claim 53 (Previously Presented): The compound of claim 30, wherein Z is selected from the group consisting of an alcoholate group, -OH and an amine.

Claim 54 (Previously Presented): The compound of claim 30, wherein  $R^2$  is a phenyl group;

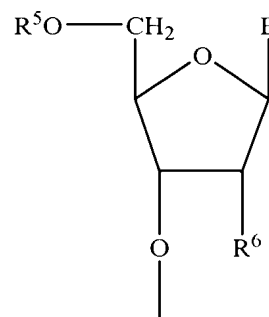
$R^4$  is a hydrogen atom or an alkyl group having up to 4 carbon atoms;

X is O;

and Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



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wherein  $R^5$  is H;

$R^6$  is selected from the group consisting of H, OH, an alkoxyl having up to 4 carbon atoms, and an alkenoxyl group having up to 4 carbon atoms;

and

B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 55 (Previously Presented): The compound of claim 1, wherein  $R^1$  and  $R^3$  are selected from the group consisting of H and  $\text{NO}_2$ , wherein  $R^1$  and  $R^3$  are not both  $\text{NO}_2$ ;

$R^2$  is selected from the group consisting of a phenyl group and a benzoyl group;

$R^4$  is selected from the group consisting of a methyl group and an ethyl group; and

X is oxygen.

Claim 56 (Previously Presented): The compound of claim 55, wherein Z is a deoxyribonucleoside;

$R^6 = \text{H}$ ; and

B is selected from the group consisting of adenine, cytosine, guanidine, thymine and uracil.

Claim 57 (Previously Presented): The compound of claim 1, wherein Z is a deoxyribonucleoside;

$R^6 = H$ ; and

B is selected from the group consisting of adenine, cytosine, guanidine, thymine and uracil.